SUPPLEMENTAL REVIEW OF THE 1993 SITE WIDE ENVIRONMENTAL ASSESSMENT FOR THE NATIONAL RENEWABLE ENERGY LABORATORY AT GOLDEN, COLORADO

February 2000

PURPOSE AND NEED

In May 1993, the Department of Energy (DOE) published a Finding of No Significant Impact (FONSI) associated with its May 1993 Site Wide Environmental Assessment (SWEA) for the National Renewable Energy Laboratory (NREL) located at the base of South Table Mountain (STM) near Golden, Colorado. The EA and FONSI were prepared pursuant to the National Environmental Policy Act (NEPA) and in accordance with the regulations implementing NEPA. The DOE regulations state that (i) a site wide NEPA document (whether it is an EA or an EIS) should be prepared "at least every five years" or (ii) DOE "evaluate" the existing site wide NEPA document to determine whether it is adequate or whether a new site wide document should be prepared. Accordingly, DOE conducted a Supplemental Review to determine whether the existing SWEA remains adequate, whether to prepare a new SWEA, revise the FONS1, or prepare a site wide EIS. The following is a summary of the Supplemental Review.

SUMMARY

Existing Environment. Subsequent to the 1993 SWEA the existing environmental baseline for the NREL STM site has been examined in the preparation of three other documents: (i) the NREL Site Environmental Report for 1995 and 1996- (ii) the EA for the Right-of-way Easement for Public Service Company of Colorado at South Table Mountain Site Golden, Colorado- and (iii) the Conservation Easement Baseline and Categorical Exclusion. Collectively, these documents present a comprehensive baseline inventory of the existing environment at the NREL STM site.

Program and Resources. The DOE mission at the NREL STM site remains focused on the development of renewable energy technologies necessary to achieve the nation's goals of improving the environment, maintaining economic competitiveness, and achieving energy security. The five-year staffing and funding trend for both NREL and DOE-Golden Field Office suggests only modest increases.

Major Facilities Added. Since the 1993 SWEA, seven major facilities have been constructed at the NREL STM site adding approximately 168,000 gross square feet (gsf) of building space. Five of the seven buildings are research facilities and were included in the alternatives evaluated in the 1993 SWEA. These include the 10,944 gsf Thermal Test Facility (TTF), the 114,800 Solar Energy Research Facility (SERF), the 10,285 Gsf Outdoor Test Facility (OTF), the 22,700 gsf Alternative Fuels User Facility (AFUF), and the 2,600 gsf Solar Radiation Research Laboratory (SRRL).

The other two facilities are support facilities and include the 850 gsf Site Entry Building (SEB) and the 6,400 gsf NREL Visitors Center (VC). These two buildings were not evaluated in the 1993 SWEA. The SEB is essentially an appropriately equipped gatehouse. The VC was built with private funds by Midwest Research Institute and donated to DOE for use at NREL.

Development in the Adjoining Community

Population Growth. The Denver region's strong growth in the early 1990s has continued and the region's 1998 population exceeded 2,286,000. The population growth around the NREL STM site (i.e., Jefferson County and the City and County of Denver) has shown the slowest growth in the region.

Traffic and Congestion. Regional average daily traffic and peak hour congestion have increased along the north-south arterial routes near the NREL STM site (Wadsworth, Kipling, Sheridan, and Youngfield) and the east-west express routes (Interstate 70, U.S. Highway 40, and U.S. Highway 6). Similarly, the regional average daily traffic and peak hour congestion along these same north-south arterial routes and east-west express routes are expected to increase annually to at least the year 2015

Commercial and Residential Development near NREL. With regard to residential development, in 1997 a large multi-building luxury-gated apartment complex was constructed within the Denver West Office Park and next to the NREL laboratory main gate. There has, however, essentially been no additional residential development in the surrounding unincorporated community of Pleasant View. With regard to commercial development, a 300,000 square foot retail marketplace near the intersection of Denver West Boulevard and Colfax/U.S. Highway 40 was constructed and was fully developed by June 1999. While a 1,000,000 square foot enclosed mall has been proposed across the street from the new retail marketplace for many years, there has been no development to date. Subsequent to the 1993 SWEA there has been four buildings added to the Denver West Office Park. These buildings add approximately 323,000 square feet of office space to the Denver West Office Park.

Annexation. The Cities of Golden and Lakewood established the relational municipal planning boundaries around the NREL STM site over IO years ago. However, since the 1993 SVTEA, the City of Lakewood has formally annexed most of the property directly to the east and south of the STM site. The residential community of Pleasant View lies directly to the southwest of the STM site. While Pleasant View remains within Golden's planning area, the City of Golden has no immediate plans to initiate formal annexation proceedings. There appears to be no current effort on the part of Golden or Lakewood to annex the NREL STM site. However, annexation within the municipal boundary of one of these two cities cannot be ruled out.

DETERMINATION

Based upon my review of the Supplemental Review, I find that the Supplemental Review adequately documents the changes to the environmental baseline presented in the 1993 SWEA for the NREL STM site, including changes to the area surrounding the STM site. I further find that none of the information and data presented in the Supplemental Review represents a substantial change to the actions or alternatives considered in the 1993 SWEA.

Therefore, I have determined that: (i) the current actions and reasonably foreseeable actions presented in the Supplemental Review are not inconsistent with the Finding of No Significant Impact issued for the 1993 SVVTA and (ii) no new or supplement to the SWEA is required at this time.

Issued in Golden, Colorado, February 2, 2000.

[Original Signed By]

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Frank M. Stewart, Manager
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I. PURPOSE AND NEED FOR A SUPPLEMENTAL REVIEW

In May 1993, the Department of Energy (DOE) published a Finding of No Significant Impact (FONSI) associated with its May 1993 Site Wide Environmental Assessment (SWEA) for the National Renewable Energy Laboratory (NREL) located at the base of South Table Mountain (STM) near Golden, Colorado. The EA and FONSI were prepared pursuant to the National Environmental Policy Act (NEPA) [1] and in accordance with the regulations implementing NEPA [2]. The DOE regulations implementing NEPA state:

> DOE shall evaluate site-wide EAs [Environmental Assessments] by means of an analysis similar to the Supplement Analysis to determine whether the existing site-wide EA remains adequate, whether to prepare a new site-wide EA, revise the FONSI, or prepare a site wide EIS [Environmental Impact Statement], as appropriate. [3]

The DOE regulations also state:

> [t]he Supplement Analysis must contain sufficient information for DOE to determine whether:
>
> (i) An existing EIS should be supplemented;
> (ii) A new EIS should be prepared; or
> (iii) No further NEPA documentation is required. [4]

Moreover, the DOE regulations state that (i) a site wide NEPA document (whether it is an EA or an EIS) should be prepared "at least every five years" or (ii) DOE "evaluate" the existing site wide NEPA document to determine whether it is adequate or whether a new site wide document should be prepared. [5]

In light of the requirement to prepare a new site wide NEPA document or to evaluate the existing site wide NEPA document (the 1993 SWEA), the Golden Field Office (DOE-GO) evaluated the existing SWEA for its NREL facility located at South Table Mountain (including the management, oversight, and administrative support activities taking place in surrounding office buildings in the Denver West Office Park). Accordingly, DOE conducted an evaluation similar to a Supplement Analysis (hereafter referred to as the Supplemental Review) to determine whether the existing SWEA remains adequate, whether to prepare a new SWEA, revise the FONSI, or prepare a site wide EIS.

Availability of the Supplemental Review

This Supplemental Review is available at the DOE-GO Public Reading Room located at the NREL Visitors Center. The address is:

U.S. Department of Energy Public Reading Room
National Renewable Energy Laboratory Visitors Center
15013 Denver West Parkway
Golden, CO 80401

The telephone number is (303) 384-6565. The text of this Supplemental Review is available on the DOE-GO Internet home page at http://www.eren.doe.gov/golden/electrondocs.html.

II. BACKGROUND

Mission

Under the authority of the Solar Energy Research, Development, and Demonstration Act of 1974 [6] the National Renewable Energy Laboratory (NREL), originally designated the Solar Energy Research Institute (SERI), was established as the nation's primary research laboratory responsible for exploring renewable energy possibilities. The United States Department of Energy's (DOE) mission at NREL has focused on the development of renewable energy technologies necessary to achieve the nation's goals of improving the environment, maintaining economic competitiveness, and achieving energy security. NREL is a government owned – contractor operated state-of-the art research and development facility. [7] NREL serves as a center of excellence for direct assistance to private and public sector researchers and decision-makers. In the past, NREL's science and technology portfolio (i.e., the inventory of specific competencies and expertise within NREL) has included photovoltaics, wind, biomass, solar thermal, and solar building energy technologies.

Advancing the development and commercialization of energy efficiency and renewable energy technologies is the main job of the Golden Field Office (DOE-GO), which is currently located in an office building within the Denver West Office Park adjacent to NREL at South Table Mountain (STM) near Golden, Colorado. As the primary field agent for the DOE Office of Energy Efficiency and Renewable Energy (DOE-EE), DOE-GO serves as a catalyst for partnerships between DOE, NREL, other government offices, and the private sector. DOE-EE has oversight for and funds most of the research activities conducted at or by NREL. By partnering with other government offices, industries, and universities around the country, DOE-GO helps develop and transfer technologies into the marketplace where they can be used by industry and consumers. DOE-GO is also responsible for administering the NREL contract.

DOE-GO is also responsible for procurement activities at DOE-EE's six Regional Offices (RO). These six offices are located in: Atlanta, Boston, Chicago, Denver, Philadelphia, and Seattle. The Denver Regional Support Office (Denver RO) is co-located in the same office building with DOE-GO. The ROs help states, communities, industries, and other key customers make better use of energy efficiency and renewable energy technologies. By providing feedback on local energy

issues, concerns, and opportunities, the ROs serve as a link between DOE-EE, other national energy policy makers, and the end-users of our services. The States served by the Denver RO include: Colorado, Kansas, Louisiana, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming.

NREL South Table Mountain Site

The NREL STM site currently encompasses approximately 325 acres of land on the toe, slope, and mesa of South Table Mountain near Golden, Colorado. This is a semi-arid geographic region typified by sparse precipitation, low relative humidity, abundant sunshine, and large daily and seasonal temperature variations. The solar radiation (sunlight energy) climate of the region is excellent for outdoor research and testing of solar energy conversion devices and systems. Sunshine is abundant throughout the year and remarkably consistent from month to month and season to season.

The complexity and diversity of the region is characterized most dramatically in its physical features. The STM site is located at the intersection of the eastern plains of Colorado and the foothills of the Rocky Mountains. The grassy, gently rolling hills of the plains contrast sharply with the craggy, steep slopes, forests, and alpine meadows of the mountains. Erosional forces have sculpted deep gorges and gentle valleys in the area. Spectacular "hogback" outcroppings of tilted sandstones, shales, and conglomerates line the interface between mountain and plain. Steep mountains, sharp ridges, mesas, gentle slopes, valleys, and ravines are all found in close proximity.

The site is situated on the top and south facing slopes of South Table Mountain, an isolated mesa that stands about 480 feet above adjacent valley areas. The mesa top slopes to the south and a prominent cliff rims the top, ranging from approximately 30 feet high on its south side to over 145 feet on the north side. Elevations on the STM site range from 5,730 to 6,050 feet above sea level.

As part of a "Good Neighbor" policy, the STM site is an "Open" site during daylight hours allowing pedestrians access to the open space and natural beauty of the mesa top and slopes through our lands. A variety of wildlife is present and visible at the STM site during dusk and dawn periods. The most commonly observed species include the field mouse, cottontail rabbit, jackrabbit, coyote, red fox, mule deer, red-tailed hawk, golden eagle, American kestrel, horned lark, American robin, European starling, black-billed magpie, and western meadowlark. Garter snakes and rattlesnakes are also abundant on the STM site. Occasionally, elk and mountain lion have also been observed at the mesa top. No hunting is allowed and weapons of any sort are banned.

The STM site also contains two structures of historic interest; an amphitheater with a stone footbridge and a stone faced ammunition bunker dating back to the years of World War II. These structures were nominated for inclusion, were accepted, and are now listed in the National Register of Historic Places.

Consolidated Mutual Water Company of Lakewood, Colorado supplies potable and firewater to the STM site and numerous easements exist for the routing of the pipelines. This water is provided via a one million-gallon underground storage tank located adjacent to the STM site on the mesa

top. Pleasant View Water and Sanitation District provides wastewater service to the STM site. Electricity (13.2 KVA) and natural gas are supplied by Public Service Company of Colorado (PSCo) via overhead lines and underground conduits/pipelines. PSCo provides electricity via single point metering. NREL takes the power from this metering point and provides power to the remainder of the site via an underground infrastructure system. U.S. West supplies telephone and electronic communication services through a government-owned switch.

III. PRIOR ANALSYSES: EXISTING NEPA EVALUATIONS AND OTHER PERTINENT ENVIRONMENTAL DOCUMENTS

1993 NREL Site Wide Environmental Assessment

In May 1993, DOE published a Finding of No Significant Impact (FONSI) associated with its May 1993 Site Wide Environmental Assessment (SWEA) for NREL at STM. [8] The EA and FONSI were prepared pursuant to the National Environmental Policy Act (NEPA) of 1969 [9] and in accordance with the regulations implementing NEPA. [10] The SWEA, in addition to the No Action alternative, considered three options for NREL. The first or preferred option essentially represented the *status quo* of DOE building out the STM site campus with government-owned facilities to gradually expand NREL's in-house research and development capabilities. The second option focused on the increased use of off-campus leased facilities to expand NREL's research and development capabilities. The third option accentuated expanding NREL's research and development capabilities by increasing the percentage of funds awarded through subcontracts to universities and private companies. The first option was the only alternative thought by DOE in the 1993 SWEA to be responsive to meeting the department's conservation and renewable energy goals.

1995 – 1996 NREL Site Environmental Report

The NREL Site Environmental Report for 1995 and 1996 [11] represents a summary of the environmental management program at NREL for calendar years 1995 and 1996. The report includes site characterization (including environmental, historical, cultural, and natural resource features of the STM site) information and a discussion of environmental management efforts at NREL. The report includes the following elements:

- Pollution Prevention and Waste Minimization
- Hazardous and Radioactive Waste Management
- Waste Sites and Emergency Reporting
- Drinking Water
- Water (Surface, Ground, and Waste)
- Air Quality
- Endangered Species
- Historic Preservation
- Floodplain Management
- Protection of Wetland
- Integrated Pest Management
- Lands and Soils

1998 Environmental Assessment and Right-of-way Easement for Public Service Company of Colorado at South Table Mountain Site Golden, Colorado

On April 17, 1998, DOE published a FONSI associated with the granting of a right-of-way easement to Public Service Company of Colorado (PSCo). [12] In 1997, PSCo approached DOE-GO with a request for a right-of-way easement to cross approximately one-third (1/3) mile of the NREL property for the purpose of installing and maintaining a portion of a high-pressure natural gas pipeline. The pipeline project was needed so that PSCo could provide anticipated services to PSCo customers in Boulder, Jefferson, and Weld Counties. Since PSCo does not have the authority to proceed on federal property without consent, the right-of-way easement constituted such federal consent. The selected option resulted in a generally north-south route across the STM mesa top and the southern STM slope of the NREL site. This option resulted in the shortest distance across the site and the least disturbance to existing and potential uses of the NREL site.

This EA was prepared to support DOE in its decision making process with regard to its decision to either grant or deny an easement to PSCo. The EA presents a comprehensive baseline inventory of the existing environment at the NREL STM site. In effect, this EA fully updates the existing environment description presented in the 1993 SWEA in the following areas:

- Biological Resources (Vegetation; Wildlife; Threatened, Endangered, and Colorado Natural Heritage Program Species)
- Geology (Topography; Soils; Geologic-Related Hazards)
- Cultural Resources
- Land Use (Existing and future uses; Transportation)
- Visual Resources
- Hydrology/Water Quality (Surface and Ground)
- Air Quality
- Noise

This EA also contains a full compendium of the vegetation species found at the STM site.

1999 NREL Conservation Easement Baseline and Categorical Exclusion

On June 17, 1999, DOE concluded a tri-party real estate closing associated with the former Camp George West military reservation.[13] The Camp George West property is adjacent to NREL and STM. In 1996, the Colorado General Assembly determined that Camp George West was no longer suitable for military purposes. The General Assembly subsequently enacted legislation that directed the Colorado Department of Military Affairs to sell 64 acres of Camp George West to Jefferson County. The Colorado National Guard had previously used the military reservation for many years.[14] Under the divestiture plan agreed to by DOE, Jefferson County, and the State of Colorado in September 1998, Jefferson County would acquire most the of Camp George West property. In addition, DOE would acquire 25 acres of the Camp George West property from

Jefferson County. Further, DOE would grant to Jefferson County a conservation easement on 178 acres of undeveloped land adjacent to the NREL facility at STM. On September 16, 1999, DOE-GO executed a Categorical Exclusion (A7 Transfer of Property, use unchanged) pursuant to 10 C.F.R. Part 1021.[15]

Jefferson County, in conjunction with the conservation easement, will be responsible for maintaining a trail easement granted by DOE. Since the conservation easement grants no rights of access, the trail easement was granted to ensure there is no change in the limited access the public has to the undeveloped DOE property surrounding the NREL facility. The trail easement will limit public passage to the specific trail identified in the easement, however, it will permit the public to traverse through the conservation easement to gain access to other properties Jefferson County holds in trust or as open space.

The specific conservation values associated with the conservation easement are documented in the Conservation Easement Baseline Inventory.[16] This document describes in general terms the existing natural and cultural resources found within the conservation easement (i.e., geologic, hydrologic, vegetation, wildlife, cultural, and scenic resources). This document also contains a compendium of the easement's flora and fauna. This document will also be updated on an annual base as needed.

IV. ISSUES

Program and Resources

Program Growth

As NREL prepares for the nation's energy needs in the next century, its science and technology portfolio continues to grow. This growth starts with specific DOE mission objectives and other national goals that flow down to the NREL Five-year Plan (hereinafter Five-year Plan). [17] Pursuant to the 1999-2003 Five-Year Plan, NREL resources will be deployed to assist in eight major areas of opportunity. These areas are: (i) Energy and Chemicals from Simple Molecules; (ii) Fundamental Materials and Engineering Science; (iii) Transportation Sector; (iv) Building Sector; (v) Industrial Sector; (vi) Government Sector; (vii) Electric Sector; and (viii) Bioenergy Science and Technology.

The goal of DOE-EE is to develop cost-effective energy efficiency and renewable energy technologies that protect the environment and support the nation's economic competitiveness. DOE-EE will achieve this goal through a balanced program of research, development, and market deployment through key public-private partnerships. To this end, DOE-EE is organized around the four main energy users — utilities, industry, transportation, and buildings.

Resources

In terms of DOE-EE funding for NREL, the projected five-year funding trend (1998 – 2002) shows only modest increases in the NREL budget. Similarly, the projected five-year staffing trend (1998 - 2002) shows only modest increases in the number of payrolled personnel working at NREL. These projections reflect only for payrolled personnel. At any given time, NREL's overall work staff may include 100 to 150 other types of workers such as temporary workers, students, and visiting professionals.

Projected NREL Funding and Staffing

Fiscal Year	Funding ($)	Staffing
1998 (actual)	176,000,000	837
1999 (estimated)	185,000,000	850
2000 (projected)	189,000,000	867
2001 (projected)	192,000,000	884
2002 (projected)	196,000,000	902

The five-year funding trend for DOE-GO shows modest increases in both program direction (funds associated with salary and benefits for the federal workforce and support service contractors at DOE-GO) and program support (funds associated with support of DOE-EE program activities administered through DOE-GO). The DOE-GO federal workforce is expected to increase very modestly in fiscal years 1999 and 2000. No staffing increases are expected in the federal workforce after fiscal year 2000. There are expected to be no changes in the number of support service contractor personnel at DOE-GO.

Projected DOE-GO Funding and Staffing

Fiscal Year	Program Direction ($)	Program Support ($)	Staffing (Federal)	(Contractor)
1999 (estimated)	6,475,000	70,156,000	70 (44)	(26)
2000 (projected)	7,699,000	73,664,000	78 (52)	(26)
2001 (projected)	9,542,000	77,347,000	78 (52)	(26)
2002 (projected)	10,019,000	81,214,000	78 (52)	(26)
2003 (projected)	10,520,000	85,275,000	78 (52)	(26)

Although the Denver RO workforce is co-located with DOE-GO, its budget and staffing needs are not administered by DOE-GO. The Denver RO is a component of DOE headquarters and reports to DOE-EE's Office of Management and Operations. Accordingly, there has been no attempt to segregate the funding and staffing profile for the Denver RO from DOE-EE's overall budget direction and staffing profile.

Major Facilities Added Since 1993

Thermal Test Facility (TTF)

Year Constructed: 1996 Acquisition Cost: $1,177,777
Space: 10,944 gsf Net Usable Space: 9,850 nsf
Laboratories: 6,895 nsf Full Time Staff: 6 (2,955 nsf)

The TTF consolidates NREL's active solar, passive solar and ventilation test facilities in a central location. The TTF is an open-space, high-bay area divided into laboratories. The facility's layout gives researchers tremendous flexibility where experiments can easily be set-up, modified or torn down to accommodate the changing needs of industry partners. Research activities focus on increasing the use of energy efficiency and renewable energy technologies in the building sector by developing new, cost-effective and environmentally friendly building equipment and energy systems. The goal is to develop and evaluate building system designs; develop building commissioning, maintenance and retrofit tools; develop an optimum balance between renewable energy and energy efficiency technologies to meet a building's energy needs; and test advanced building components. The TTF building is a showcase for integrated energy efficiency features, including high-efficiency lighting, space conditioning (heating, ventilating and air conditioning), water heating, and daylighting design.

Solar Energy Research Facility (SERF)

Year Constructed: 1993 Acquisition Cost: $18,491,239
Space: 114,800 gsf Net Usable Space: 70,386 nsf
Laboratories: 42 (56,309 nsf) Full Time Staff: 220 (14,077 nsf)

The Solar Energy Research Facility (SERF) is a state-of-the-art research facility utilized for the development of technologies for converting sunlight into electricity through photovoltaics, superconductivity and related material sciences. The facility consists of three adjoining modules, each with two pods, a laboratory pod in the back, and an office pod in the front. The laboratories are composed of two parallel rows of bays separated by a 14-foot-wide service corridor. There are currently 42 separate laboratories. The SERF building is also a showcase for integrated energy efficiency features, including high-efficiency lighting, space conditioning (heating, direct evaporative cooling, indirect evaporative cooling, laboratory exhaust heat recovery), water heating, and daylighting design, window shades controlled by photovoltaic sensors, and upsized cooling towers. Construction was started prior to the 1993 SWEA, but completed after its publication.

Outdoor Test Facility (OTF)

Year Constructed: 1995 Acquisition Cost: $1,042,138
Space: 10,285 gsf Net Usable Space: 9,462 nsf
Laboratories: 8 (6,623 nsf) Full Time Staff: 14 (2,839 nsf)

The Outdoor Test Facility consists of state-of-the-art laboratories, outdoor test beds, and support services used to test the performance and reliability of photovoltaic modules fabricated by NREL researchers and industry partners. Researchers at the OTF evaluate advanced photovoltaic technologies under simulated, accelerated and prevailing outdoor conditions to verify performance and improve engineering development. Simulated and accelerated testing is conducted in eight laboratories housed within the building. A field adjacent to the laboratory building is used for actual outdoor testing. More than 3,500 tests are done on photovoltaic cells and modules annually.

Alternative Fuels User Facility (AFUF)

Year Constructed: 1984 and 1994 Acquisition Cost: $2,879,476
Space: 22,702 gsf Net Usable Space: 19,790 nsf
Laboratories: 12 (7,899 nsf) Full Time Staff: 35 (3,891 nsf)

The Alternative Fuels User Facility is utilized to evaluate the commercial potential of bioethanol technologies and the researchers work with industry to move promising research from the laboratory to the market place. Twelve state-of-the-art laboratories and a large-scale pilot plant are employed in applying cutting edge technology for the production of bioethanol as well as other products generated from biomass.

Site Entry Building (SEB)

Year Constructed: 1994 Acquisition Cost: $181,560
Space: 850 gsf Net Usable Space: 680 nsf
Full Time Staff: 3

The Site Entry Building is staffed 24 hours a day and houses the on-site security operations at the South Table Mountain site. Operations include:

- Access control
- Employee/visitor badging
- Closed Circuit Television (CCTV) monitoring
- Toxic gas alarm monitoring
- Fire alarm monitoring
- Emergency Response

Solar Radiation Research Laboratory (SRRL)

Year Constructed: 1999 Projected Acquisition Cost: $475,000
Replacement Value: $475,000 Space: 2,600 gsf

This new facility is being constructed to take the place of 20-year-old shipping containers converted to laboratory environments and inadequate elevated platform areas. In place of these outdated facilities, the SRRL will house research and metrological calibration and laboratories, office and restroom facilities, as well as an outdoor research platform capable a handling equipment and experimental apparatus envisioned for the future.

NREL's Visitors Center (VC)

Year Constructed: 1994 Acquisition Cost: $1,063,890
Space: 6,401 gsf Net Usable Space: 6,171 nsf
Full Time Staff: 2

The Visitors Center is a facility dedicated to the education of the public and advancement of renewable and energy efficient technologies. NREL's Visitors Center also houses a variety of renewable energy and energy efficiency exhibits, the building itself incorporates passive solar energy technologies and energy efficiency architectural design technologies. The facility was built by the Midwest Research Institute was donated to DOE in 1994.

Denver West and the Adjoining Community

Regional Population Growth

The Denver Regional Council of Governments (DRCOG) reports [18] that for calendar year 1998, the region's strong growth in the early 1990s isn't ending. For the 1990s, the DRCOG reports the region's population has increased by nearly 430,000 people, or 23 percent. The region's population was estimated to be 2,286,975 at the end of calendar year 1998. In calendar year 1998, the Denver region's population expanded by 2.4 percent (53,700 people) to 2,286,975 residents. In 1997, the region grew at a 2.1 percent rate (46,600 people) for a regional population of 2,233,275. The population increase through 1998 was primarily caused by people moving into the region (62.2 percent of the total increase, compared to 59.3 percent in 1997). The regional counties to the southeast have shown the most dramatic population growth. Douglas County reached a milestone during 1998 by passing the 150,000-population level; thus the county has more than doubled its 1990 population of 60,391. Similarly, Arapahoe County showed the largest population increase in 1998, adding 14,725 persons for county total of 488,275. Second in population gain for 1998 was Douglas County, with its 11,300-person increase. Third in population gain was Boulder County, which grew by 10,200 residents during 1998 for a population of 282,900. Also, during calendar year 1998, Adams County added 5,275 people, or 1.7 percent, for a total population of 319,350. Jefferson County, in comparison to the large growth in the southeast, grew by only 7,400 persons to reach a total population of 522,600, or a 1.4 percent increase. The City and County of Denver added 4,550 persons for a total population of 506,250, and experienced one of the region's slowest growth rates at 0.9 percent. The DRCOG reports that similar to past years, 1998 was a year in which most of the region's growth occurred in the southeast - Arapahoe (27.4 percent) and Douglas (21.0 percent) counties captured nearly 50 percent of the region's annual growth. About one out of every four new residents of the region made Arapahoe County home. Boulder County shared 19 percent of the region's growth, while Jefferson County accounted for about 14 percent. Adams and Denver shared 9.8 and 8.5 percent, respectively.

Average Daily Traffic

Jefferson County reports [19] that in 1995 approximately 1.8 million vehicle trips were generated within Jefferson County and that motor vehicles traveled approximately 9.5 million miles daily on major roads and streets in the county. Jefferson County reports that the number of vehicle trips per day generated from the growth households moving into Jefferson County (DRCOG forecast of 31 percent or 272,000 from 1995 to 2015) will increase by 39 percent from 1.8 million to 2.5 million trips. The Colorado Department of Transportation (CDOT) reports [20] Average Daily Traffic (ADT) data for four major arterial junctions near NREL. For calendar 1996, CDOT reports the following ADT data: (i) 78,800 at the junction of Interstate 70 and 32nd Avenue; (ii) 78,800 at the junction of Interstate 70 and Denver West Boulevard; (iii) 18,500 at the junction of Colfax/U.S. Highway 40 and Denver West Boulevard; and (iv) 20,000 for the junction of Colfax/U.S. Highway 40 and Interstate 70. With regard to annual comparative data, CDOT indicates that the 1996 ADT data suggest an annual increase of less than 5 percent for every year since 1990. However, CDOT indicates that comparative annual data for the period of 1990 to 1999 will not be available until late in calendar year 2000.[21]

Peak Hour Congestion

Using a regional travel model provided to Jefferson County by DRCOG, the county reports [22] that for calendar year 1995, approximately 17% of the county's roadway system, measured in land miles of roadway, experienced peak hour congestion worse than the established level of service. Further, most of the congestion was reported in the urban parts of Lakewood, Wheat Ridge, and Arvada, particularly along the north-south arterial routes of Wadsworth, Kipling, and Sheridan. Similarly, the east-west express artery of Interstate 70 showed peak hour congestion. A map generated from the DRCOG model for the 1995 existing peak hour congestion (updated February 1998) indicates that there are four existing peak hour congested areas near NREL. [23] These existing areas are: (i) Youngfield Street between Colfax/U.S. Highway 40 and 20th Avenue; (ii) 32nd Avenue exit at Interstate 70; (iii) Denver West Boulevard exit from Interstate 70 to Colfax/U.S. Highway 40; and (iii) Colfax/U.S. Highway 40 exit from Interstate 70 going west to U.S. Highway 6 and going south to U.S. Highway 6. The DRCOG map for 2015 needs shows in addition to the four existing congestion areas, that there are at least three more congested areas being forecasted near NREL. [24] These are: (i) Youngfield Street between 20th Avenue and Ward Road; (ii) Interstate 70 between the Denver West Boulevard and 32nd Avenue exits; and (iii) expanded congestion areas west and east of the Colfax/U.S. Highway 40 exit from Interstate 70.

Municipal Annexations Near NREL

The Cities of Golden and Lakewood have for over 10 years followed a planning area map that shows the relative areas of unincorporated Jefferson County near NREL that each City has responsibility over for purposes of regional development. [25] The NREL STM laboratory is wholly within an unincorporated portion of Jefferson County. Since its inception, similarly unincorporated Jefferson County has surrounded NREL, including the STM site and leased buildings within the Denver West Office Park. In 1994, however, a portion (approximately 30 acres) of Jefferson County south of the Denver West Boulevard/ Interstate 70 overpass and north of Colfax/U.S. Highway 40 was annexed into the City of Lakewood. A retail marketplace

has been developed on this parcel of land. The marketplace was fully developed as of May 1999 and is in excess of 300,000 square feet of commercial space. [26] Another, but larger and fully enclosed regional fashion mall has been proposed for development on a parcel of property on the south side of Colfax/U.S. Highway 40 across from the marketplace. This proposed 1,000,000 square foot mall is within the Lakewood planning area and will presumably be annexed by the City in the near future.[27]

In April 1999, the City of Lakewood initiated proceedings to annex approximately 245 acres of the Denver West office park and to zone the parcels as Planned Development (i.e., municipal zoning that conforms with the then existing Jefferson County commercial and residential zoning of Service and Non-service Office, Regional Commercial, and Neighborhood Park). [28] The annexation ordinance became final on August 14, 1999 and the conforming zoning became effective August 30, 1999. [29] Ostensibly, the resulting annexation brings the municipal boundary for the City of Lakewood to the NREL front gate at STM. The annexation resulted in several property enclaves that remain in unincorporated Jefferson County. One enclave that adjoins the STM site consists of property held by and doing business as the Denver West Marriott Hotel. Another adjoining enclave consists of a building owned by the Jefferson County School Board. A portion of this building is leased by and for NREL. The largest enclave remaining in Jefferson County includes a multi-building luxury-gated apartment complex that opened for business in 1997. The apartment complex also adjoins the STM site.

Build-out of the Denver West Area

In 1997 a 320 unit luxury-gated apartment complex (Oasis Residential, Incorporated) opened for business. The complex adjoins the east side of the STM site and northwest corner of the Denver West Office Park. The apartments range in size from 800 to 1,300 square feet with rent approaching $1,300 per month for the largest units. The Denver West Office Park consists of approximately 750 acres and has freeway access from Interstate 70 from the Denver West Boulevard exit. The Denver West Office Park is managed by Denver West Management, Incorporated. The Denver West Office Park is a mature non-industrial commercial office park; however, several buildings have been built since 1992. [30] These buildings include: (i) Building #64, with approximately 127,000 square feet of rental space, was completed in 1996 with American Management Systems as the major tenant; (ii) Boston Market has occupied two new buildings (a two story headquarters building with approximately 64,000 square feet completed in 1994 and a three story general office building with approximately 96,000 square feet completed in 1996); and (iii) a 36,000 square foot lodge-type structure featuring rough-hewn logs built for The Coleman Company in 1996 (now occupied by a different tenant). [31] There are no current plans to build any additional buildings within the Office Park. [32] Major tenants, other than NREL, include, but are not limited to Boston Market, Quest Communications, Fluor Daniels, E2 Consulting Engineers, Bonfils Blood Bank, American Management Systems, and Denver Eye Surgeons. [33]

V. PROPOSED OR REASONABLY FORSEEABLE FUTURE ACTIONS NOT ADDRESSED

Long-term Need for Administrative Support Space

It is incumbent on DOE to adequately assess and plan for long-term space needs for both the federal and contractor workforce. As previously noted, the projected five-year staffing trend for both the federal and contractor workforce is for modest increases in the number of people working at NREL buildings and the support personnel working in buildings adjacent to NREL in the Denver West Office Park. Currently, DOE is assessing the reasonably foreseeable future office space needs at NREL. This assessment is a necessary precursor step in developing meaningful information DOE might consider in its NEPA decision making process. DOE is still in the early stage of assessing its needs. DOE will fully comply with the requirements of NEPA once there is sufficient information such that it can meaningfully evaluate the alternatives and the relative environmental impacts of these alternatives. At this time, there are three tentative options DOE might develop further in its NEPA decision making process: (i) purchase of existing Denver West Office Park buildings; (ii) new construction; and (iii) continue leasing.

Purchase Existing Buildings

The acquisition of existing buildings within the Denver West Office Park was identified as a tentative option. The NREL Contractor, during the third quarter of fiscal year 1999, completed a preliminary analysis of this option. This preliminary analysis included buildings currently being leased for NREL and DOE uses as well as other buildings within the Office Park. This option was considered a reasonable alternative to constructing a new building. The analysis showed some favorable features to this option: (i) ease of transition/limited institutional disruption; (ii) could be implemented quickly; (iii) reasonable purchase cost; and (iv) substantial savings over continued leasing. Prior to the completion of this preliminary analysis, however, it was learned that the outstanding option for DOE or the NREL Contractor to acquire the existing buildings within the Denver West Office Park had expired. If at some later date the opportunity to acquire the existing building becomes available again this option could become a reasonable alternative and thus, be a part of a future NEPA analysis.

New Construction Option

On May 21, 1995, DOE-GO published in the Commerce Business Daily an Expression of Interest (i.e., a market survey) for a privatization initiative to develop (build, operate, and maintain) a 250,000 gross square foot research support facility at NREL. [34] Similarly, DOE included the following requirement in its 1998 NREL Management and Operating Contract with Midwest Research Institute. [35]

> To ensure NREL's long-term viability as a world-class facility which provides the best-value to the DOE, the Contractor shall, in cooperation with DOE, perform an assessment of the long-term space requirements and shall develop options to address these needs. NREL-related operations currently occupy 622,000 gross square feet of space – of which 295,000 gross feet is leased. Approximately 650

personnel are housed in four separate, leased buildings; this accounts for approximately 250,000 of the 295,000 feet of leased space. If it is determined by DOE that consolidation of these employees to the Government's South Table Mountain site is in the best interest of the Government, the Contractor shall enter into good-faith negotiations with DOE to structure a lease-purchase arrangement to provide for the private financing, design, construction, and thereafter operation, of one or more new buildings on Government land to meet this need.

The siting and construction of any new facility would necessarily be a part of a future NEPA analysis.

Continue Leasing

Another option would be to maintain the status quo and continue to lease buildings as needed. Buildings within the Denver West Office Park have been leased for NREL and DOE uses for many years and there is no indication that these buildings would not be available for continued leasing in the future. Generally, the level of NEPA required for the continuation of a lease is that of a Categorical Exclusion determination.

Possible Additional Research Facilities at NREL

Possible Photovoltaics Science and Technology Facility (PV-STF)

The primary goal of the National Center for Photovoltaics (NCPV) at NREL is to help implement the National PV Program by encouraging the most efficient use of the nation's PV resources. The national program exists to support the United States' PV industry in improving the cost-effectiveness, performance, and reliability of its products. Most companies cannot afford large research facilities of their own, so the national program funds long-term, high-risk, high-payoff research, development, and testing of PV components and systems in partnership with the PV industry. In this way, we are investing in the nation's future by helping these companies bring clean, affordable electricity to the domestic and international marketplace. Consistent with the NREL Five-year Plan, the PV-STF would be a new facility designed to support the National PV program. The SERF was built to support only 160 researchers. Currently it supports nearly 200 scientists. The new PV Science and Technology building is envisioned as a 30,000 square foot facility that would fill a long-standing need for additional research space for PV technology.

Possible Distributed Power Interconnection Engineering Laboratory

NREL conducts studies and research relating to distributed generation and energy system interconnection. The goals of the distributed generation and interconnection program are to ensure the reliability and security of the nation's electric power system, increase utilization of renewable energy sources, enable customer choice in power options, and to enable distributed utility options that integrate renewable energy sources with natural gas and electric power. The distributed generation concept represents a major change in the way electric power systems could be designed and operated. In the distributed model, small, modular generation sources (such as renewable generation and storage systems) are located throughout the entire distribution system close to the

customer load. By adding these small elements into their distribution systems utilities may defer or eliminate investments in transmission and distribution, and customers may enjoy more reliable supply, expanded services, and a cleaner environment. An essential element of NREL's research program is examining the differing requirements needed for grid-interconnection by the various renewable energy systems (e.g., wind, solar, biomass). Developing universally accepted interconnection standards for a renewable energy system is a NREL goal. The new distributive would be one or more small "butler buildings" of approximately 200 square feet per building.

Possible Plant Biotech Laboratory

NREL supports DOE programs to develop and implement bioenergy projects (biomass and biofuels). Biofuels are a renewable and inexhaustible source of fuels that offer our country many benefits. Because biofuels are grown domestically, they reduce our dependence on foreign oil, help boost the U.S. economy, and help strengthen U.S. energy security. Biofuels are alcohols, ethers, esters, and other chemicals made from cellulosic biomass such as herbaceous and woody plants, agricultural and forestry residues, and a large portion of municipal solid and industrial waste. NREL's research in the past has targeted processes that convert cellulose to ethanol. Continued improvements in such key technical areas as feedstock pretreatment, fermentation microorganisms, and cellulase will make biochemical conversion of biomass to ethanol a more efficient and economical route to renewable fuels production. Future bioenergy research will focus on basic biological sciences, genetic engineering, and feedstock development. The new Plant Biotech Laboratory would be constructed to support future bioenergy research at NREL. The facility would essentially be a 7,000 square foot addition to the exiting AFUF.

VI. ACTIONS POTENTIALLY REQUIRING FURTHER ANALYSIS BUT NOT CONSIDERED

Headquarters NEPA Documents

While DOE-GO is also responsible for overseeing the procurement activities at the six Regional Offices, DOE-EE is responsible for program direction. Ordinarily, DOE-EE is responsible for ensuring the Regional Offices comply with the requirements of NEPA. Similarly, DOE-EE provides the overall program direction for DOE's renewable energy mission, inclusive of DOE-GO, NREL, the ROs, and specific projects apportioned by DOE-EE to other DOE national laboratories (e.g., Biofuels Feedstock Development Program at Oak Ridge National Laboratory). In this light, DOE-EE is also ordinarily responsible for programmatic NEPA analyses. Therefore, existing and proposed actions which are under the direct program management of DOE-EE (be it Headquarters or one of the ROs) have not been considered in this supplemental review. The Environmental Assessment and FONSI for the State Energy Conservation Program DOE EA is an example of an existing programmatic NEPA document. [36] This programmatic environmental assessment (PEA) assesses the impacts associated with the DOE State Energy Conservation Program (SECP).

Actions Relating to Individual Procurements

The DOE-GO serves as the Head of the Contracting Authority for a wide variety of financial assistance agreements (i.e., grants and cooperative agreements) associated with renewable energy research and development and demonstration projects. These projects will ordinarily be completed at a location other than at the Denver West Office Park or STM locations. The scope of some of these projects being funded (in part or in whole) by DOE fall into the type of actions that normally requires the preparation of an EA or an EIS. [37] Similarly, some actions proposed or sponsored by NREL will require the preparation of an EA or an EIS. Reasonably foreseeable projects proposed or sponsored by NREL that will be accomplished at the Denver West Office Park or the STM site will be considered in this supplemental review. Proposed actions that will be accomplished at off-site locations will not be considered here, but will, nonetheless, be evaluated and documented under a specific NEPA document prepared for that proposed action. A recent example is the draft EA prepared by DOE-GO incident to a cooperative agreement that proposes to refurbish, retrofit, and operate a 20 million-gallon per year biomass to ethanol production facility in Jefferson Davis Parish, Louisiana. [38]

End Notes

1. 42 U.S.C. 4321 *et seq*.

2. Council on Environmental Quality (CEQ) regulations, 40 C. F. R. 1500; DOE regulations 10 C.F.R. 1021; DOE Order 451.1A.

3. 10 C.F.R. 1021.330(e).

4. 10 C.F.R. 1021.314(b);

5. 10 C.F.R. 1021.330(d)

6. 42 U.S.C. 5551 *et seq*.

7. NREL is a DOE National Laboratory currently operated by a contractor team consisting of Midwest Research Institute, Battelle Memorial Institute, and Bechtel National, Incorporated. The current contract team was selected September 30, 1998.

8. Site Wide Environmental Assessment for the National Renewable Energy Laboratory, Golden, Colorado, May 1993. DOE/EA-0850.

9. 42 U.S.C. 4321 *et seq*.

10. Council on Environmental Quality (CEQ) regulations, 40 C. F. R. 1500; DOE regulations 10 C.F.R. 1021; DOE Order 451.1A.

11. National Renewable Energy Laboratory Site Environmental Report for 1995 and 1996, MP-190-23148, June 1997.

12. Environmental Assessment: Right-of-Way Easement for Public Service Company of Colorado at the South Table Mountain Site, Golden, Colorado, April 1998. DOE/EA-1254.

13. Intergovernmental Agreement Between Jefferson County and the United states of America, June 17, 1999; Pertinent recorded documents include: (i) Partial Release of Right of First Refusal to Purchase Real Property (No. FO891349); (ii) Commissioner's Deed (No. FO891356); (iii) Consent to Easement (No. FO891352); (iv) Conservation Easement (No. FO891358); (v) Trail Easement (No. FO891357); and (vi) Conservation Easement Option Agreement.

14. Colorado General Assembly House Bill 96-1072, signed into law by Roy Romer, Governor of the State of Colorado, April 7, 1996.

15. 10 C.F.R. 1021, Subpart D, Appendix A, Categorical Exclusion A7, Transfer, lease, disposition, or acquisition of interests in personal property (e.g., equipment and materials) or real property (e.g., permanent structures and land), if property use is to remain unchanged; i.e., the type and magnitude of impacts would remain essentially the same.

16. National Renewable Energy Laboratory Conservation Easement Baseline Inventory, , 1999.

17. National Renewable Energy Laboratory Five-year Plan 1999-2003, March 15, 1999.

18. Denver Regional Council of Governments internet site, http://www.drcog.org/reg_data/county.html ; November 17, 1999.

19. Jefferson County internet site, http://co.jefferson.co.us/dpt/highways/traftran/background.html; November 17, 1999.

20. Data sheet provided on July 27, 1999 by facsimile from Bob Tenny, Lead Analyst, Traffic Analysis Unit, Colorado Department of Transportation.

21. Information provided during telephone conversation on July 16, 1999 with Bob Tenny, Lead Analyst, Traffic Analysis Unit, Colorado Department of Transportation.

22. Jefferson County internet site, http://co.jefferson.co.us/dpt/highways/traftran/background.html; November 17, 1999.

23. *Id*.

24. *Id*.

25. Map entitled Exhibit A, "Lakewood/Golden Planning Area Boundary"; GIS Mapping, Property Management Division, City of Lakewood.

26. Information provided on August 27, 1999 during interview with Judith Karinen, Senior Planner, City of Lakewood.

27. *Id*.; Information provided on August 3, 1999 during interview with Robert Narraci, Development Review Coordinator, Jefferson County.

28. April 7, 1999 Letter of Notice for Proposed Annexation and accompanying information from City of Lakewood.

29. Information provided during telephone conversation on July 16, 1999 with Judith Karinen, Senior Planner, City of Lakewood.

30. Information provided during telephone conversation on November 22, 1999 with a representative from Denver West Management, Incorporated.

31. *Id.*

32. *Id.*

33. The Western Area Power Administration is relocating to a new facility in an area of Lakewood, Colorado that is approximately four miles southeast of the Denver West Office Park. The relocation process is expected to occur during the first two quarters of fiscal year 2000.

34. Notice, Expression of Interest, NREL Research Support Facility Privatization; Commerce Business Daily, May 21, 1995.

35. National Renewable Energy Laboratory Contract, U.S. Department of Energy and Midwest Research Institute; Contract No. DE-AC36-98GO10337; Contract Clause H-17.

36. The Programmatic Environmental Assessment and FONSI for the State Energy Conservation Program. DOE/EA-1068, 1996.

37. 10 C.F.R. 1021, Subpart D, Appendix C and Appendix D.

38. Draft Environmental Assessment Biomass to Ethanol Demonstration Project at BC International Corporation's Ethanol Facility in Jefferson Davis Parish, Louisiana, June 1999. DOE-GO EA Control Number 97-G0-09.